

Department of Physiology

Department of Physiology (Hons.), CO & PO, UG CBCS, 2018-19 to 2022-2023

SEMESTER 1

- **Paper-CC1TH– Cellular Basis of Physiology** (Cell Structure and Function, Cellular Transport, Genetics, Cell Cycle, Enzyme)

CO1:

- ✓ To know the unit of the human system as a cluster of living material
- ✓ Basic interconnectivity among those units
- ✓ Origin and root of living cell production
- ✓ DNA as the Key molecule
- ✓ To know the basic modulator of the human system
- ✓ The physicochemical laws behind the control
- ✓ The modern concept of the allied molecules with the similar properties.

- **Paper -CC1P-Practical** (Cell division, Cell viability, Cell fragility, Tissue staining)

CO1P:

- ✓ To get practical demonstration of the cell division
- ✓ Basic Cellular Property Studies including membrane
- ✓ Exposure to tissue staining and structure learning.

- **Paper -CC2TH–Biophysical Principles & Chemistry of Biomolecules**

CO2:

- ✓ To visualize human body as a representative system carrying all the physicochemical properties of the nature
- ✓ To conceptualize the living body as a thermodynamic system
- ✓ Principle and use of different types of Microscopes, Colorimeter, Spectrophotometer etc. as supportive tools to have clearer vision towards the cell study
- ✓ To know the basic biochemical components of human system

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- **Paper-CC2P -Basic Biochemistry Practical** (Qualitative test & preparation of buffer, pH)

CO2P:

- ✓ Identification of the physiologically important substances and primary idea about their abnormality
- ✓ Basic idea about the preparation of a required biochemical working solution.

SEMESTER 2

- **Paper-CC3TH –Cell Signaling and Nerve-Muscle Physiology**

CO3:

- ✓ Basis of Signal transduction mechanism within cells
- ✓ Pathways, Messengers, molecules and the enzymes involved in the transmission
- ✓ Wire connections within human system—the Nerves
- ✓ To have intricate idea about the basis of body movements both external and internal
- ✓ Reasons behind recognizable and non-recognizable movements
- ✓ Concept of Muscle Receptors and their properties.

- **Paper --CC3P –Nerve, Muscle and Collagen Staining Practical**

CO3P:

- ✓ To have a preliminary hands-on work to see the histological structure of three different muscles, nerve and collagen
- ✓ Conceptualizing Compound Microscopy.

- **Paper-CC4TH–The Nervous System**

CO4:

- ✓ Brain as the supreme Controller and coordinator of human system
- ✓ All reflexes, their origin and effect
- ✓ The characterization of the fluid within neuronal system—the Cerebrospinal fluid
- ✓ Intricate idea about different parts of the system, their structural units, anatomical positioning, specific roles
- ✓ ANS & Limbic System and Tracts
- ✓ Different types of receptors and their involvement at molecular level.

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- **Paper CC4P–Concept of Brain imaging & Kymographic Recording**

CO4P:

- ✓ To gain basic concept of brain imaging and importance of different scanning
- ✓ To record the isotonic & isometric contractions at different conditions.

SEMESTER 3

- **Paper–CC5TH- Physiology of Blood & Body Fluids**

CO5:

- ✓ To have an idea of the root of flexibility of the human body and its interconnectivity as a whole basically due to the fluid system
- ✓ Cellular as well as fluid part composition and functions of blood
- ✓ To know blood cells as lifesaving as well as life taking molecules
- ✓ Other parallel fluid systems like lymph & body fluids
- ✓ Exposure to different Blood and Circulatory disorders.

- **Paper– CC5P–Hematological Experiments**

CO5P:

- ✓ To identify different blood cells morphologically
- ✓ Study on different blood and allied cell types, staining and quantification
- ✓ Estimation of hemoglobin
- ✓ Preparation of hemin crystals.

- **Paper–CC6TH–Cardiovascular System**

CO6:

- ✓ Anatomical position and structure of heart
- ✓ Heart as the pumping system of the body
- ✓ Functioning of the heart to maintain the status-co of the internal system
- ✓ Principles of Electrocardiography
- ✓ Blood pressure as one of the major factors for proper maintenance of the human system.

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- **Paper-CC6P–Cardiovascular Physiology Experiments**

CO6P:

- ✓ To get trained for measuring the BP
- ✓ To determine the Pulse pressure, Mean pressure
- ✓ Preparation of Physiological fluid and its application
- ✓ Comparison of normal and abnormal cardiac functioning by ECG.

- **Paper-CC7TH–Respiratory System**

CO7:

- ✓ Lung as the air container cum passage of physiological system
- ✓ Measurement, techniques and principle of spirometry
- ✓ Gaseous transport, interaction with different bio- molecules
- ✓ Breathing difficulties & disorders.

- **Paper CC7P–Respiratory Human Experiments**

CO7P:

- ✓ To have direct exposure to lung function Test
- ✓ Learning of Pneumography

SEMESTER 4

- **Paper CC8TH–Digestion and Metabolism**

CO8:

- ✓ The histological structure as well as the anatomical position of alimentary canal
- ✓ The accessories for propagation of digestion
- ✓ The secretions and their actions
- ✓ The energy producing pathways and their regulations through both metabolic and catabolic pathways.

- **Paper–CC8P-Dale’s and Quantitative estimations**

CO8P:

- ✓ To observe the movements and propagation in tracts of the body
- ✓ To have an exposure towards quantitative estimation.

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- **Paper–CC9TH-Molecular Biology & Methodologies**

CO9:

- ✓ A journey through the root of the process and molecules of life
- ✓ Basic cause of various gene related diseases
- ✓ Application of DNA technology in therapy & research
- ✓ Principle, methodologies and application of different modern laboratory techniques
- ✓ The use of radioisotopes as an important patho-physio lab- tool and the precautionary measures.

- **Paper-CC9P-Biochemical Estimation**

CO9P:

- ✓ Quantification of solutes of physiological as well as pathological importance using blood/serum
- ✓ Preliminary exposure to chromatographic techniques.

- **Paper–CC10 TH Nutrition & Dietetics**

CO10:

- ✓ Idea about Macro and Micronutrients, their utilization & importance
- ✓ The different parameters to determine the nutritional status of the body
- ✓ Balanced diet as a remedial correction of different strata of people of different work sectors.

- **Paper–CC10P--Nutrition & Dietetics Practical**

CO10P:

- ✓ To assess own family's nutritional status by survey work
- ✓ Qualitative analysis and nutritional value of common foodstuff.

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SEMESTER 5

• **Paper CC11TH–Special Sense**

CO11:

- ✓ All special senses of human and their regulatory mechanism
- ✓ Mechanism of perception
- ✓ Abnormality and remedy.

CO11P:

- ✓ Identification of mammalian tissues and organs
- ✓ Testing of the abnormality of the different special sense organs.

• **Paper–CC12TH –Endocrinology**

CO12:

- ✓ Hormones as biomodulator
- ✓ Different bio- modulators
- ✓ Heart as an endocrine organ
- ✓ To know the Circadian effect, biorhythm and bio-clock.

CO12P:

- ✓ Effect of hormones on mammalian tissue
- ✓ Identification of mammalian tissues.

SEMESTER 6

• **Paper-CC13TH-Reproductive Physiology & Developmental Biology**

CO13:

- ✓ Sex organs and characters
- ✓ Histology and anatomy of reproductive organs
- ✓ Effect of hormones on puberty, adolescence and reproduction
- ✓ Pregnancy Test
- ✓ To know the mother cell
- ✓ Importance of stem cell and its application
- ✓ Embryogenesis and organogenesis.

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CO13 P:

- ✓ Identification of the sections of mammalian glandular tissue & cell space demonstration
- ✓ Immunological tests for the confirmation of pregnancy.

• **Paper CC14TH–Excretory system, Body temperature, Environmental Pollutants and Human Health**

CO14:

- ✓ Structure anatomy & function of kidney
- ✓ Formation, functioning and abnormalities in urine formation
- ✓ Parametric control of renal circulation
- ✓ Renal function tests
- ✓ Physical & Physiological processes of the body temperature regulation
- ✓ Involvement of modulators in the maintenance of body temperature
- ✓ The effect of different pollutants on human health.

• **Paper–CC14P-Biochemical & Histological identification**

CO14P:

- ✓ Comparison of normal and abnormal constituents of urine
- ✓ Identification of stained histological sections.

DISCIPLINE SPECIFIC ELECTIVES [SEMESTER 5]

Group-A

• **Paper–DSEA2TH –Microbiology & Immunology**

CO15:

- ✓ To know the survival strategy of the body against the microbial world
- ✓ Defense Mechanism of the body
- ✓ Interrelationship between human and Microbes
- ✓ Detail of the body cells' involvement and interaction in disease
- ✓ Vaccine and their implication.

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- **Paper DSEA2P–Microbiology & Immunology Practical**

CO15P:

- ✓ To segregate the bacterial world by staining method
- ✓ To get interest in identifying shape of different bacteria
- ✓ Use of Oil Immersion Microscope.

Group-B

- **Paper- DSE B1 TH–Work, Exercise and Sports Physiology**

CO16:

- ✓ Physiological definition as well as basis of work
- ✓ Exercise as a daily work system and its importance
- ✓ Basic concept of work organization
- ✓ Physical fitness and training programme and training principle
- ✓ Bioenergetics.

DSE B1P

CO16P:

- ✓ To determine the Physical fitness by different tests
- ✓ To measure allied parameters of Body fitness.

DISCIPLINE SPECIFIC ELECTIVE [SEMESTER-6]

- **Paper–DSEA4 TH [Community & Public Health]**

CO17:

- ✓ It gives a totally different vision towards the application of the Physiological studies
- ✓ Social & Community Developmental orientation
- ✓ Concept of Healthy Community
- ✓ Population Control and Family planning Methodologies.

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DSE A4 P

CO17P:

- ✓ To have direct training for project preparation
- ✓ Training of Survey Work by questionnaire methods
- ✓ Use of handy instruments and methods for collection of data in public
- ✓ Exposure to Statistical analysis.

• **Paper-DSE B4TH-Toxicology and Pharmacology**

CO18:

- ✓ Toxins and Toxicology
- ✓ Types of toxins and its effect on human body
- ✓ Bioavailability
- ✓ Dose effect and remedies.

CO18P:

- ✓ Dose effect of different drugs/toxins/molecules on perfused heart.

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Department of Physiology (General), CO & PO, UG CBCS, 2018-19 to 2022-2023

Outcome of the programme:

- ✓ To know the unit of human system and its cellular organization
- ✓ Tissues and their mechanism of action
- ✓ Internal connectivity–Fluid and neuronal system
- ✓ Physicochemical laws to run the physiological machinery
- ✓ Anatomical position of different organs, their structural composition, functions and control mechanism
- ✓ Biomolecules: Metabolism, Catabolism and Bioenergetics
- ✓ To understand root of cell differentiation: Stem cell, Gene, Genome, DNA, mRNA, rRNA, tRNA, Transcription, Translation
- ✓ To explain the cellular and molecular mechanisms of different body parts
- ✓ Functions and the disease conditions that may arise due to changes in these mechanisms
- ✓ Pharmacology as well as Toxicology with a vision towards remedial measure Nutrition and Dietetics for a healthy life
- ✓ Glimpses of Bacteriology, Virology, Immunology, Molecular Genetics and Basic statistics
- ✓ Ergonomics basics and Sports & Exercise Physiology as an index of Fitness
- ✓ Research techniques and Methodologies and laboratory use
- ✓ Practical exposure and training towards Biochemical estimation, Basic Physiological parameters' measurement, Histological staining processes, Nutritional Survey work, Haematological techniques.

The ultimate motto of the course is to build up a Confident Basic Physiologist to serve the Community.

Rammohan College
102/1, Raja Rammohan Sarani, Kolkata, 700009

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Programme Objective of UG Physiology Course (Honours and General):

The primary objective of the course is to know the 'Human System' as the most prospective, potent and closest image of the nature. It primarily focuses on the origin of life, DNA as the carrier of heredity, structural and functional inter-relationship of different systems, Biomolecules as the source of energy of the body, the enzymes and hormones as the major controller system of human, molecular integration, Host-Parasite interaction and the remedies including the modern methodologies, concepts and technologies to step forward to a better tomorrow.